IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A method of tracking ~~a~~ resonant frequencies ~~frequency~~ of ~~an~~ first and second electrically resonant structures having a nominal difference frequency ~~structure~~ comprising the steps of:

generating a first reference signal having a variable frequency encompassing the possible resonant frequency of the first resonant structure;

generating a second reference signal having a variable frequency encompassing the possible resonant frequency of the second resonant structure;

summing the first and second reference signals;

exciting said first and second resonant structures with said summed signal;

mixing a composite response signal received from said first and second resonant structures with the first reference signal;

filtering the mixed composite response and first reference signals and using the resulting filtered signal within a controlled loop to track the resonant frequency of the first structure;

mixing the composite response signal of said first and second resonant structures with said second reference signal; and

filtering the mixed composite response and second reference signals and using the resulting filtered signal within a controlled loop to track the resonant frequency of the second resonant structure.

~~exciting the resonant structure with a reference signal of a variable frequency encompassing the possible resonant frequency of the resonant structure, mixing a response signal from the resonant structure with the reference signal, filtering the mixed response and reference signals to remove the sum products from the composite signal, using the resulting amplitude modulation component of the response signal within a control loop to track the resonant frequency of the resonant structure, .summing the reference signal from said oscillator with a second reference signal of a variable frequency encompassing the possible resonant frequency of a second resonant structure, the first and second resonant structures having a nominal difference frequency, exciting~~

~~said first and second resonant structures with said mixed signal, mixing the composite response signal of said first and second resonant structures with the first reference signal, filtering the mixed signal and using the resulting signal within a control loop to track the resonant frequency of the first resonant structure, and mixing the composite response signal of said first and second structures with said second reference signal, filtering the mixed signal and using the resulting signal within a control loop to track the resonant frequency of the second resonant structure.~~

2. (Cancelled)

3. (Previously presented) A method according to claim 1, wherein the or each mixed response and reference signals are filtered using a low pass filter.

4. (Previously presented) A method according to claim 1, comprising the further step of suppressing the amplitude modulation of the or each reference signal by using a signal source of low output impedance.

5. (Previously presented) A method according to claim 1, wherein the or each reference signal passes through an impedance before exciting the or each resonant structure.

6. (Previously presented) A method according to claim 1, comprising the further step, for the or each reference signal, of mixing the response signal with a phase shifted version of the or each reference signal, filtering said mixed signal, squaring the filtered in-phase and phase shifted mixed response and reference signals, summing the associated squared signals and using the result within a control loop to provide a phase compensated track of the resonant frequency of the associated resonant structure.

7. (Original) A method according to claim 6, wherein the reference signal is phase shifted through 90 degrees.

8. (Currently Amended) An apparatus for tracking ~~a~~ resonant <u>frequencies</u> ~~frequency~~ of

first and second electrically resonant structures having a nominal difference frequency, ~~an electrically resonant structure~~, comprising:

a first variable frequency oscillator providing ~~an~~ a first excitation signal of a variable frequency encompassing the possible resonant frequency of said first resonant structure; ~~,~~

a second variable frequency oscillator providing a second excitation signal of a variable frequency encompassing the possible resonant frequency of the second resonant structure;

a coupling ~~means~~ device connecting said first and second variable frequency ~~oscillator~~ oscillators to said first and second resonant structures ~~structure,~~ ;

~~an~~ a first I-mixer forming a first synchronous detector having a first input connected to said first variable frequency oscillator and a second input connected to the coupling device, the first I-mixer mixing the excitation signal from the first variable frequency oscillator with a composite response signal received from the first and second resonant structures; ~~generated by the resonant structure in response to the excitation signal,~~

a first filter connected to the output of the first I-mixer which filters the output of the first I-mixer to remove the sum products of excitation and response signals; ~~, thereby leaving just an amplitude modulation component of the signal, and~~

processing means which processes the filtered signal to track the resonant frequency of the first resonant structure, and further comprising:

a second I-mixer forming a second synchronous detector associated with the second oscillator having a first input connected to the second oscillator and a second input connected to the coupling device so as to mix the second excitation signal from the second oscillator with the composite response signal received from said first and second resonant structures;

a second filter connected to the output of the second I-mixer which filters the output signal of the second I-mixer; and

second processing means which processes the filtered signal from the second I-mixer to track the resonant frequency of the second resonant structure.

~~wherein the apparatus for tracking the resonant frequencies includes a pair of electrically resonant structures having a nominal difference frequency, and further comprising a second variable frequency oscillator connected to the coupling means, said first variable frequency oscillator providing an excitation signal of a variable frequency encompassing the possible resonant frequency of the first resonant structure and said second variable frequency oscillator providing an excitation signal of a variable frequency encompassing the possible resonant frequency of the second resonant structure, a second I-mixer forming a synchronous detector associated with the second oscillator having its first input connected to the second oscillator and its second input connected to the coupling device so as to mix the excitation signal from the second oscillator with a composite response signal received from said first and second resonant structures, and a second filter connected to the output of the second I-mixer which filters the output signal.~~

9. (Cancelled)

10. (Previously presented) An apparatus according to claim 8, wherein said first and second resonant structure are connected in parallel.

11. (Previously presented) An apparatus according to claim 8, further including a summer having first and second inputs connected to the first and second oscillators respectively, and an output connected to the coupling means.

12. (Previously presented) An apparatus according to claim 8, wherein the or each filter is a low pass filter.

13. (Previously presented) An apparatus according to claim 8, further comprising an impedance connected between the or each oscillator and the coupling device, the first input of the or each I-mixer being connected between its associated oscillator and its impedance and the second input of the or each I-mixer being connected between the associated impedance and the coupling device.

14. (Currently amended) An apparatus according to claim 8, further including a Q-mixer associated with the or each oscillator having a first input connected to its associated oscillator by means of phase shifting means and a second input connected to the coupling means such that the or each Q-mixer mixes a phase shifted version of the excitation signal from its associated oscillator with the response signal, a filter connected to the output of the or each Q-mixer which removes the sum products of the phase shifted excitation and response signals, ~~so as to leave just an amplitude modulation component of the signal,~~ and further including means associated with the or each oscillator for squaring and then summing the filtered signals from the I- and Q-mixers associated with the or each oscillator, said processing means processing the sum of the squares of the filtered signals from said I- and Q- mixers, whereby phase delay effects are eliminated.

15. (Original) An apparatus according to claim 14, wherein the or each phase shifting means phase shifts the signal by 90 degrees.

16. (Previously presented) An apparatus according to claim 14, wherein said means for squaring and summing said signals comprises first analog signal squaring means connected to the filtered output of the or each I-mixer, a second analog squaring means connected to the filtered output of the or each Q-mixer, and a summer associated with the or each pair of I and Q mixer having a first and second inputs connected to the outputs of the associated first and second squaring means.

17. (Previously presented) An apparatus according to claim 16, wherein the said analog signal squaring means each comprise a mixer having first and second inputs connected together to the output of its associated filter.

18. (Previously presented) An apparatus according to claim 14, wherein said means for squaring and summing the signals comprises a digital processor, the output of each filter being connected to an analog to digital converter which is, in turn, connected to an input of the digital processor.

19. (Original) An apparatus according to claim 18, wherein the or each digital processor also calculates first harmonic amplitudes of the demodulated signals and produces codes for controlling the carrier frequency of the signal source.

20. (Previously presented) An apparatus according to claim 8, wherein the coupling means is a rotational contactless coupler.